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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,508	04/09/2004	Osamu Nozawa	0524-0139.02	9824

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 07/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/821,508

Applicant(s)

NOZAWA ET AL.

Examiner

Steven H VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-10 and 12-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-10 and 12-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/952,445.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/9/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6-10, 12, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,955,223 to Mitsui et al. (Mitsui) in view of US 2002/0106830 A1 to Ohmi et al. (Ohmi) and US 5,897,977 to Carcia et al. (Carcia).
3. For claim 6, Applicant requires a manufacturing method of a photo mask blank having at least a thin film for forming a pattern comprising setting a substrate in a horizontal position where a surface of the substrate on which the thin film is being formed and a surface of a sputtering target are in opposed positions with a center axis of the target deviating from a center axis of the substrate surface and sputtering the target while rotating the substrate around its center axis so as to form the thin film.
4. Mitsui discloses a method of making a photo mask blank (Example 1), but does not describe the specifics of the sputtering apparatus. Therefore, any generic sputtering apparatus will suffice.
5. Ohmi discloses a sputtering apparatus (Figure 7) that is for producing a photo mask [0005]. The target and substrate are off-center from each other (Figure 7).

6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Matsui to use the sputtering apparatus of Ohmi to make the photo mask blank because Ohmi discloses that the apparatus is useful in making photomasks.

7. Ohmi does not indicate that the substrate rotates.

8. Carcia discloses that in order to control the deposition rate and the thickness of the deposited layers, the substrates should be rotated while sputtering (col. 3, l. 60 – col. 4, l. 11).

9. It would have been obvious over the prior art of record at the time the invention was made to modify the apparatus of Ohmi to rotate the substrate because of the desire to control the deposition rate and deposition thickness.

10. For claim 7, Applicant requires the target and substrate to form a predetermined angle between them. As can be seen from Figure 7 of Ohmi, there is a predetermined angle between the substrate and the target.

11. For claim 8, Applicant requires rotating the substrate integer times during formation. As noted above, Carcia shows that it is obvious to rotate the substrate.

12. For claims 9 and 10, Applicant requires the thin film to be a phase shift film and the blank to be a phase shift mask blank. Mitsui is making a phase shift mask blank (title).

13. For claim 12, Applicant requires film to be a phase shift film. Mitsui discloses making a phase shift film (Example 1).

14. For claim 14, Applicant requires the film to be a semi-transmission phase shift film for a halftone phase shift mask blank. Mitsui discloses the limitation (Example 1).

15. For claim 16, Applicant requires sputtering a target of silicon and metal in a nitrogen atmosphere so that the content of nitrogen is larger than the content of silicon. Mitsui uses a

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target of silicon and tungsten (Example 1) in a nitrogen atmosphere (Example 1) and results in a concentration of nitrogen greater than silicon (Example 1d).

Claim Objections

16. Claims 6-10 and 12-16 are objected to because of the following informalities: "in an opposed positions" should be "in opposed positions" in claim 6 at line 4. Claims 7-10 and 12-16 depend from claim 6 and contain all of the limitations of claim 6. Therefore, claims 7-10 and 12-16 are objected to for the same reasons as claim 6. Appropriate correction is required.

Double Patenting

17. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

18. Claims 6-10 and 12-15 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of copending Application No. 09/952,445 in view of US 2002/0106830 A1 to Ohmi et al. (Ohmi) and US 5,897,977 to Carcia et al. (Carcia).

19. Claims 6-10, 12, and 14 are described above. For claim 13, Applicant requires a dispersion of phase angle of the phase shift film in a plane to be within $\pm 2^\circ$. For claim 15,

Applicant requires a dispersion of a phase angle of the light semi-transparent phase shift film in a plane to be within $\pm 2^\circ$ and a dispersion of a transmittance in the plane to be within $\pm 4\%$.

20. The application claims a method of manufacturing a plurality of phase shift mask blanks (claim 1) or halftone phase shift mask blanks (claim 2) using a sputtering method to continuously form the phase shift film (claim 1) or the light semi-transmission film (claim 2) on the transparent substrate wherein a dispersion of phase angle of the phase shift film among the plurality of blanks is within $\pm 2^\circ$ (claim 1) and wherein dispersions of a phase angle and a transmittance of the light semi-transmission film among the plurality of halftone phase shift mask blanks are within $\pm 2^\circ$ and within $\pm 4\%$ respectively (claim 2).

21. The application does not disclose the sputtering apparatus used to form the mask blanks.

22. Ohmi discloses a sputtering apparatus (Figure 7) that is for producing a photo mask [0005]. The target and substrate are off-center from each other (Figure 7).

23. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of the application to use the sputtering apparatus of Ohmi to make the photo mask blank because Ohmi discloses that the apparatus is useful in making photomasks.

24. Ohmi does not indicate that the substrate rotates.

25. Carcia discloses that in order to control the deposition rate and the thickness of the deposited layers, the substrates should be rotated while sputtering (col. 3, l. 60 – col. 4, l. 11).

26. It would have been obvious over the prior art of record at the time the invention was made to modify the apparatus of Ohmi to rotate the substrate because of the desire to control the deposition rate and deposition thickness.

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27. As can be seen from Figure 7 of Ohmi, there is a predetermined angle between the substrate and the target.

28. This is a provisional obviousness-type double patenting rejection.

General Information

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.

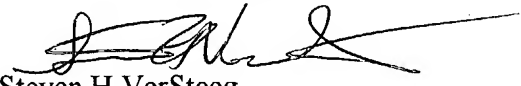
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
July 22, 2004